MD 355 Bus Rapid Transit (BRT)
Interjurisdictional Meeting

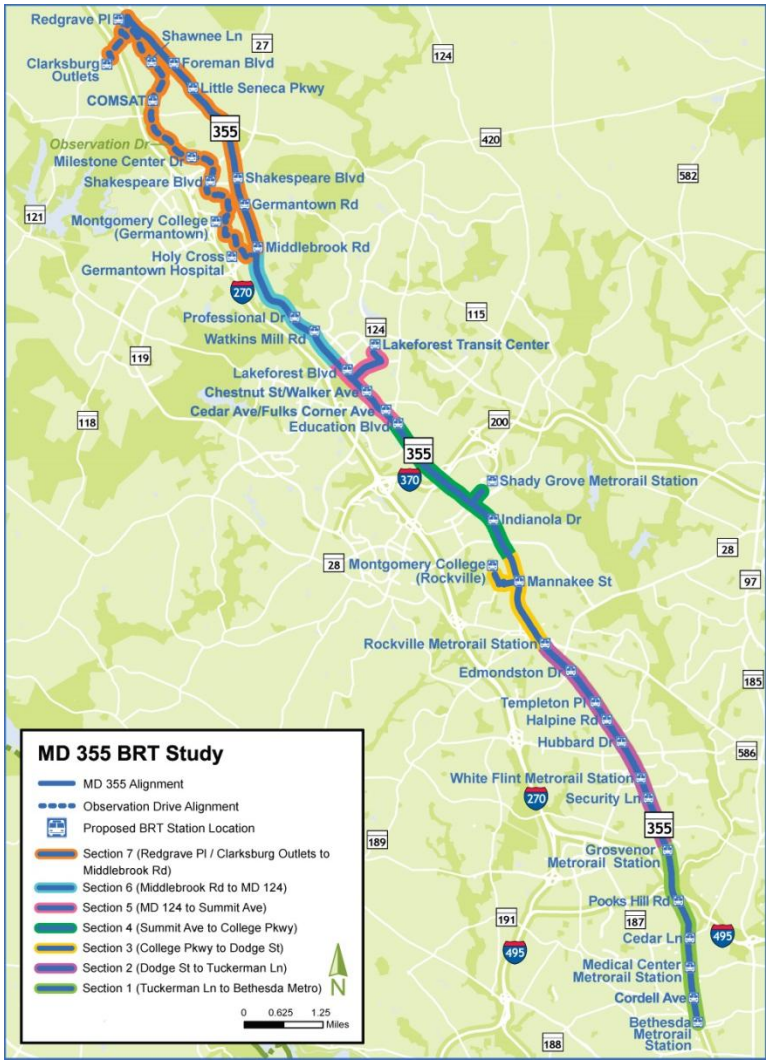
Montgomery County
RAPID TRANSIT
MD 355

Rockville, Maryland
March 9, 2017
6:30 pm to 9:00 pm

MARYLAND DEPARTMENT OF TRANSPORTATION

MCDOT
Montgomery County
Department of Transportation

MD 355 Corridor



Section	Section Limits
Section 7 – Clarksburg / Germantown	Redgrave Place / Clarksburg Outlets to Middlebrook Road ~4.7 miles
Section 6 –Germantown / Montgomery Village	Middlebrook Road to MD 124 ~3.2 miles
Section 5 – Gaithersburg	MD 124 to Summit Avenue ~1.4 miles
Section 4 – Shady Grove / Rockville	Summit Avenue to College Parkway ~3.2 miles
Section 3 – Rockville Town Center	College Parkway to Dodge Street ~1.8 miles
Section 2 – Rockville / White Flint	Dodge Street to Tuckerman Lane ~4.1 miles
Section 1 – Bethesda	Tuckerman Lane to Bethesda Metro ~3.2 miles

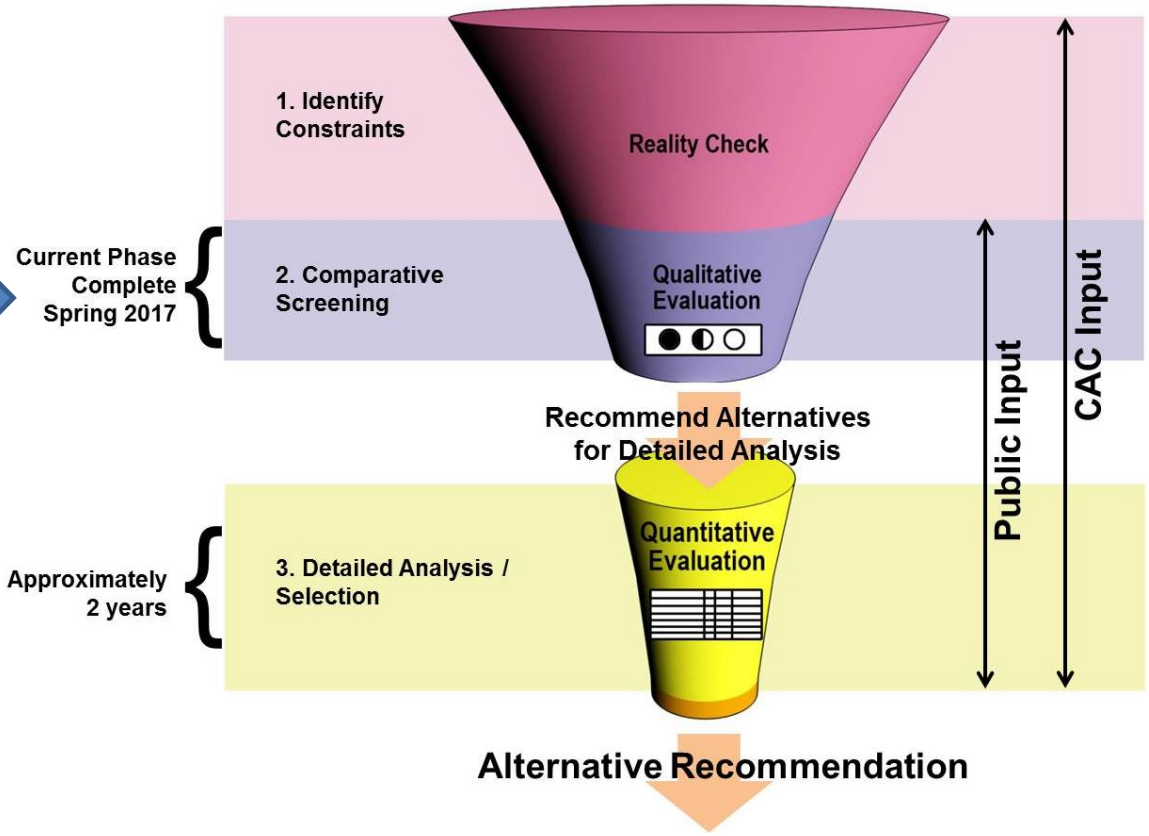
Steps to Recommending an Alternative

The Corridor Planning Study utilizes a three step process to recommend an alternative at the conclusion of this study.

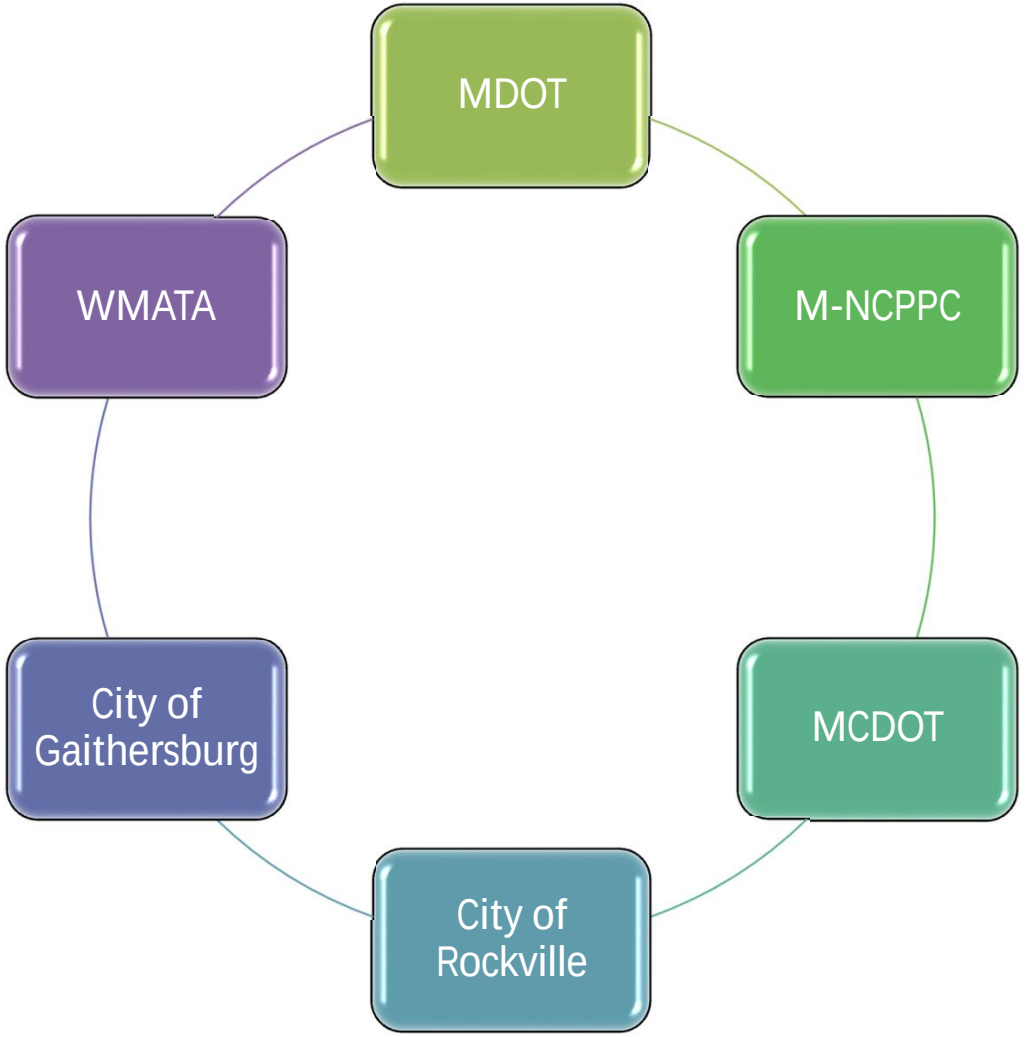
Step 1: Identify Constraints

Step 2: Comparative Screening (We are here)

Step 3: Detailed Analysis



MD 355 BRT Inter-agency Coordination



Public Involvement

- Corridor Advisory Committees
  - Consists of up to 40 members per group (North and South)
  - Total of 18 meetings held since February 2015
  - Two additional meetings scheduled for mid-May
- Stakeholder Group Meetings
  - Homeowners associations
  - Civic associations
  - Transportation management districts
- Spring 2016 Open House
  - April 28th – Bethesda (50 +)
  - May 3rd – Gaithersburg (100+)
- Winter 2017 Open House
  - February 7th – Germantown (60 +)
  - February 8th – Rockville (60+)

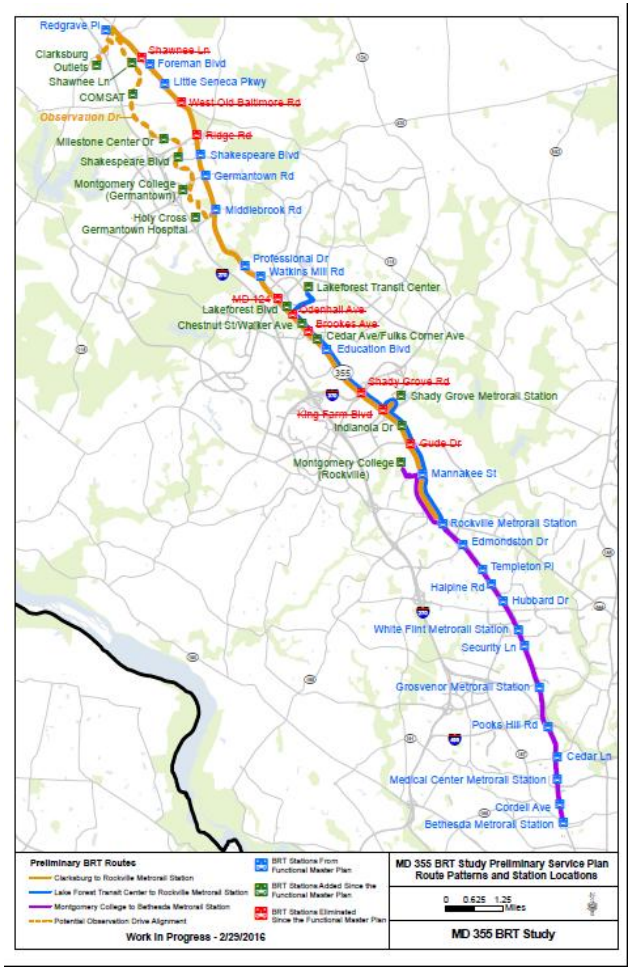
Elements of a BRT Alternative

- **Running way** – A designated facility such as a striped/signed lane or exclusive busway in which the vehicle would travel between stations
- **Station locations** - Specific locations where passengers can access the service and the service can support the local land uses (residential, commercial, etc.)

- **Service plan** - The way in which BRT operates including service frequency, hours of service, routing and connecting services

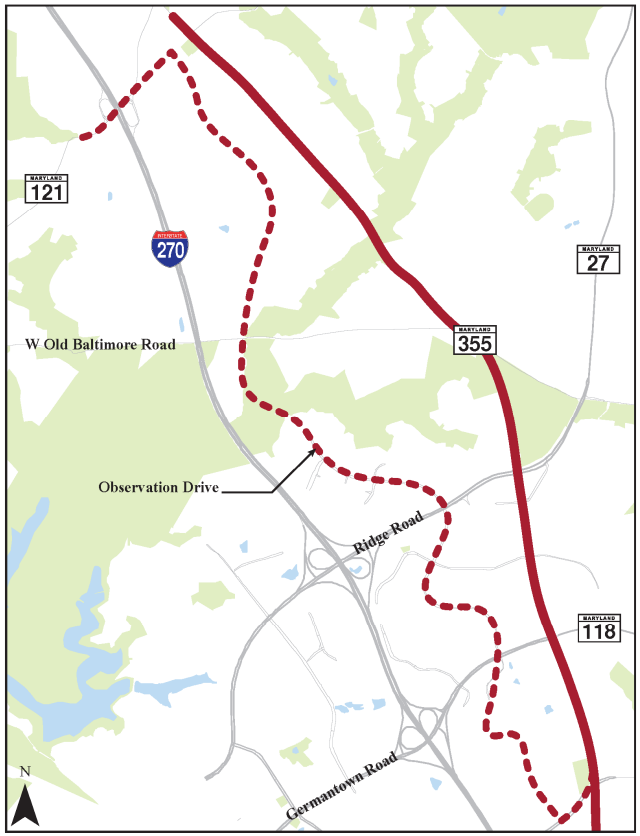
Modifications Since the Functional Masterplan

- Observation Drive
- Stations
  - Added
  - Proposed
  - Re-located
  - Eliminated
- Running way
  - Alternative 4A, Section 4



Alignment Modification since the Functional Master Plan - Observation Drive

- Clarksburg Outlets to Middlebrook Road
- Mixed traffic Operations
- Seven stations
- Serves as an alternative to operating on MD 355 between Redgrave Place and Middlebrook Road



Station locations modified since the Functional Master Plan - Germantown

Station Location	Proposed Modification	Reason
MD 27 Ridge Road	Eliminated	Congested intersection. Serves very similar area to Shakespeare Boulevard Station
West Old Baltimore Road	Eliminated	Low density. Lack of pedestrian access.
Shawnee Lane	Eliminated	Serves very similar area to Foreman Boulevard Station
Middlebrook Road	Eliminated	Transition from dedicated to mixed traffic and intersection geometry

Station locations modified since the Functional Master Plan – Germantown (Cont'd)

Station Location	Proposed Modification	Reason
Holy Cross Hospital	Proposed	Serves hospital
Montgomery College (Germantown)	Proposed	Serves Montgomery College
Shakespeare Boulevard	Proposed	Serves existing and future commercial areas
Milestone Center Drive	Proposed	Serves commercial and residential areas

Observation Drive Station locations - Germantown

Station Location	Proposed Modification	Reason
COMSAT	Proposed	Connection to Corridor Cities Transitway (CCT)
Shawnee Lane	Proposed	Consistent with CCT Master Plan
North of MD 121 (Future Clarksburg Town Center)	Proposed	Consistent with CCT Master Plan
Clarksburg Outlets	Proposed	Serves commercial and residential areas. Proposed by member of public.

Station locations modified since the Functional Master Plan - Gaithersburg

Station Location	Proposed Modification	Reason
Cedar Avenue / Fulks Corner Avenue	Added	Added based on City of Gaithersburg BRT Study
Lakeforest Transit Center	Added	Comment from CAC
Brookes Avenue	Moved to Chestnut Street / Walker Avenue	Moved based on City of Gaithersburg BRT Study
Odenhall Avenue	Moved to Lakeforest Boulevard	Moved based on City of Gaithersburg BRT Study
MD 124 (Montgomery Village Avenue)	Eliminated	Eliminated based on City of Gaithersburg BRT Study

Station locations modified since the Functional Master Plan - Rockville

Station Location	Proposed Modification	Reason
Montgomery College (Rockville)	Added	Closer connection to Montgomery College
Gude Drive	Moved to Indianola Drive	Better serve residential and commercial areas
King Farm Boulevard	Moved to Shady Grove Metro	Closer connection to Metro. Shuttle available from King Fam to Metro. Comment from CAC.
Shady Grove Road	Eliminated	Congested intersection. Low density. Comment from CAC.

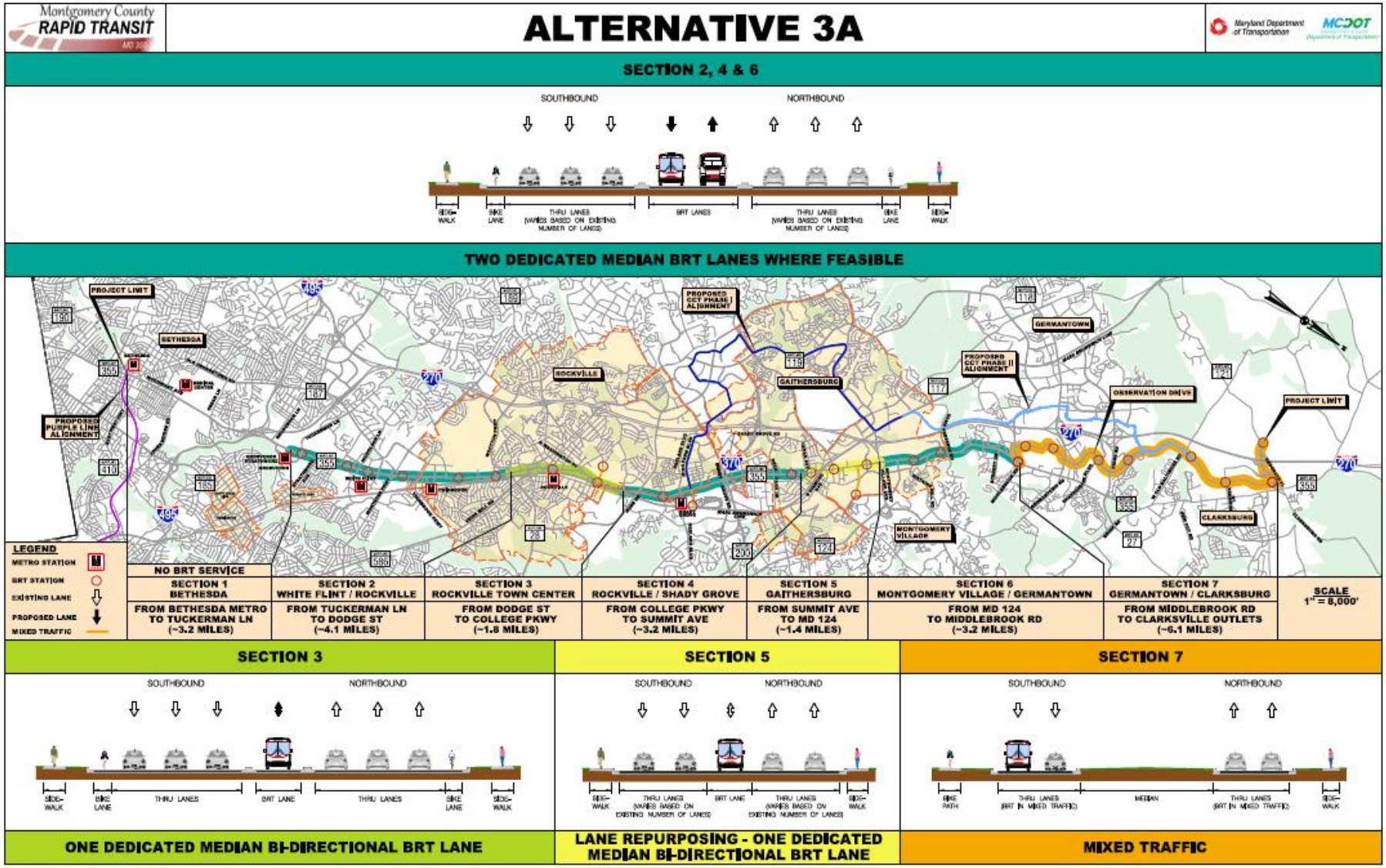
Conceptual Alternatives – Running Way Alternatives Under Consideration

- Alternative 1 No-Build
- Alternative 2 – Transportation System Management (TSM)

Moving forward to next phase of study

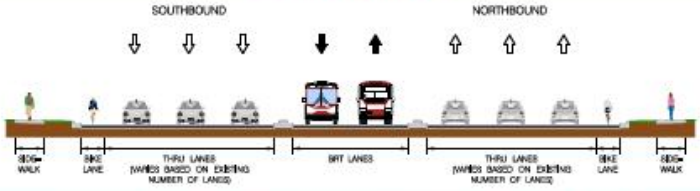
BRT Alternatives

Alternative	Primary Running Way	Northern Limit	Southern Limit
3A	Median	Clarksburg Outlets	Grosvenor Metrorail
3B		Redgrave Pl. (Clarksburg)	Bethesda Metrorail
4A	Curb	Redgrave Pl. (Clarksburg)	Grosvenor Metrorail
4B		Redgrave Pl. (Clarksburg)	Bethesda Metrorail

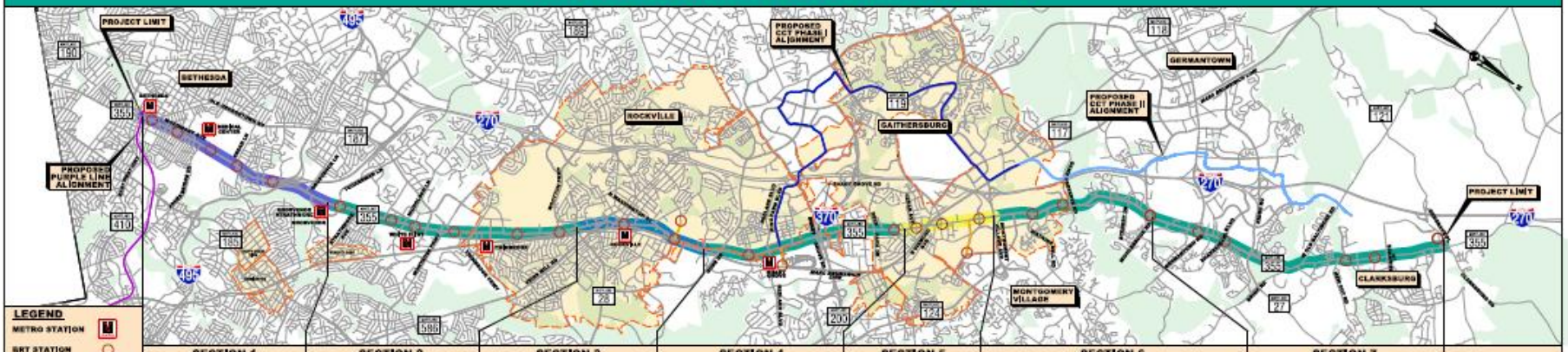

Montgomery County RAPID TRANSIT
ALTERNATIVE 3A
Maryland Department of Transportation MCDOT
SECTION 2, 4 & 6
SOUTHBOUND
NORTHBOUND
SIDE-WALK
BIKE LANE
THRU LANES (VARIES BASED ON EXISTING NUMBER OF LANES)
BRT LANES
TWO DEDICATED MEDIAN BRT LANES WHERE FEASIBLE
PROJECT LIMIT
BETHESDA
ROCKVILLE
GAITHERSBURG
GERMANTOWN
MONTGOMERY VILLAGE
CLARKSBURG
OBSERVATION DRIVE
PROPOSED PURPLE LINE ALIGNMENT
PROPOSED CCT PHASE I ALIGNMENT
PROPOSED CCT PHASE II ALIGNMENT
LEGEND
METRO STATION
BRT STATION
EXISTING LANE
PROPOSED LANE
MIXED TRAFFIC
NO BRT SERVICE
SECTION 1 BETHESDA
FROM BETHESDA METRO TO TUCKERMAN LN (~3.2 MILES)
SECTION 2 WHITE FLINT / ROCKVILLE
FROM TUCKERMAN LN TO DODGE ST (~4.1 MILES)
SECTION 3 ROCKVILLE TOWN CENTER
FROM DODGE ST TO COLLEGE PKWY (~1.8 MILES)
SECTION 4 ROCKVILLE / SHADY GROVE
FROM COLLEGE PKWY TO SUMMIT AVE (~3.2 MILES)
SECTION 5 GAITHERSBURG
FROM SUMMIT AVE TO MD 124 (~1.4 MILES)
SECTION 6 MONTGOMERY VILLAGE / GERMANTOWN
FROM MD 124 TO MIDDLEBROOK RD (~3.2 MILES)
SECTION 7 GERMANTOWN / CLARKSBURG
FROM MIDDLEBROOK RD TO CLARKSVILLE OUTLETS (~6.1 MILES)
SCALE 1" = 8,000'
SECTION 3
SECTION 5
SECTION 7
THRU LANES
BRT LANE
BIKE PATH
MEDIAN
THRU LANES (BRT IN MIXED TRAFFIC)
ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE
LANE REPURPOSING - ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE
MIXED TRAFFIC
APPENDIX A - FIGURE 1

ALTERNATIVE 3B

SECTION 2, 4, 6 & 7

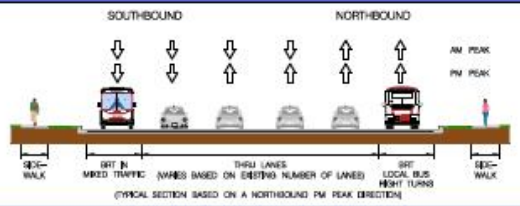


TWO DEDICATED MEDIAN BRT LANES WHERE FEASIBLE



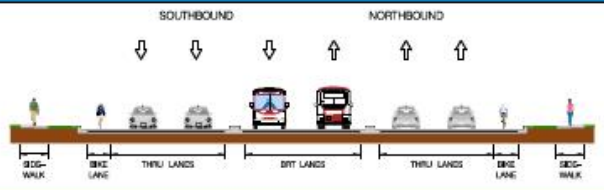
SECTION 1 BETHESDA	SECTION 2 WHITE FLINT / ROCKVILLE	SECTION 3 ROCKVILLE TOWN CENTER	SECTION 4 ROCKVILLE / SHADY GROVE	SECTION 5 GAITHERSBURG	SECTION 6 MONTGOMERY VILLAGE / GERMANTOWN	SECTION 7 GERMANTOWN / CLARKSBURG	SCALE
FROM BETHESDA METRO TO TUCKERMAN LN (~3.2 MILES)	FROM TUCKERMAN LN TO DODGE ST (~4.1 MILES)	FROM DODGE ST TO COLLEGE PKWY (~1.8 MILES)	FROM COLLEGE PKWY TO SUMMIT AVE (~3.2 MILES)	FROM SUMMIT AVE TO MD 124 (~1.4 MILES)	FROM MD 124 TO MIDDLEBROOK RD (~3.2 MILES)	FROM MIDDLEBROOK RD TO REDGRAVE PL (~4.7 MILES)	1" = 8,000'

SECTION 1



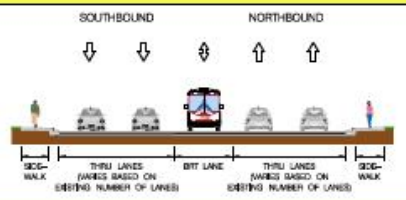
LANE REPURPOSING - CURB BRT LANE

SECTION 3



LANE REPURPOSING - TWO DEDICATED MEDIAN BRT LANES

SECTION 5



LANE REPURPOSING - ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE

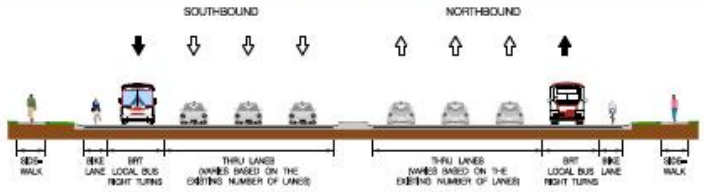
APPENDIX B – FIGURE 2

ALTERNATIVE 4A

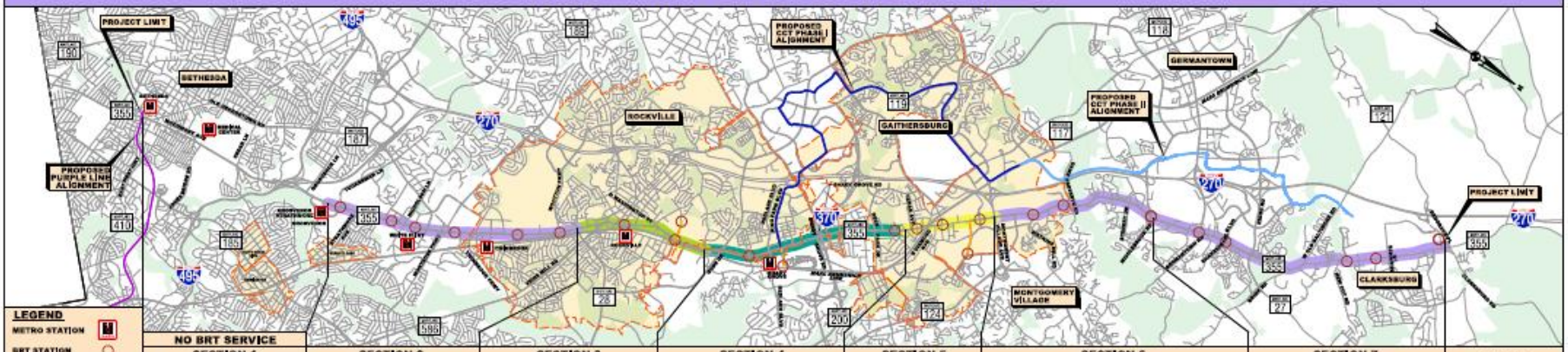
Montgomery County RAPID TRANSIT MD 355

Maryland Department of Transportation MCDOT

SECTIONS 2, 6 & 7



TWO DEDICATED CURB BRT LANES WHERE FEASIBLE



NO BRT SERVICE	SECTION 1 BETHESDA	SECTION 2 WHITE FLINT / ROCKVILLE	SECTION 3 ROCKVILLE TOWN CENTER	SECTION 4 ROCKVILLE / SHADY GROVE	SECTION 5 GAITHERSBURG	SECTION 6 MONTGOMERY VILLAGE / GERMANTOWN	SECTION 7 GERMANTOWN / CLARKSBURG	SCALE 1" = 8,000'
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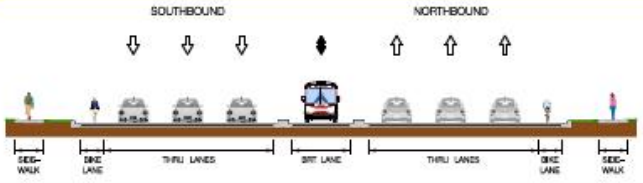
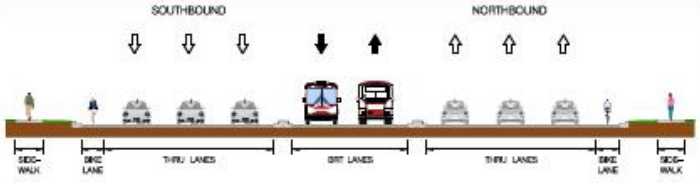
SECTION 3



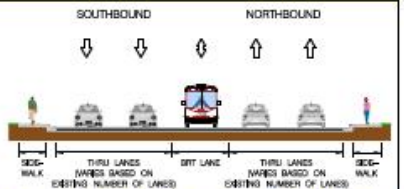
ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE

SECTION 4



TWO DEDICATED MEDIAN BRT LANES WHERE FEASIBLE

SECTION 5



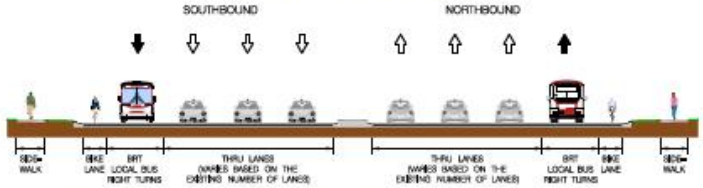
LANE REPURPOSING - ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE

ALTERNATIVE 4B

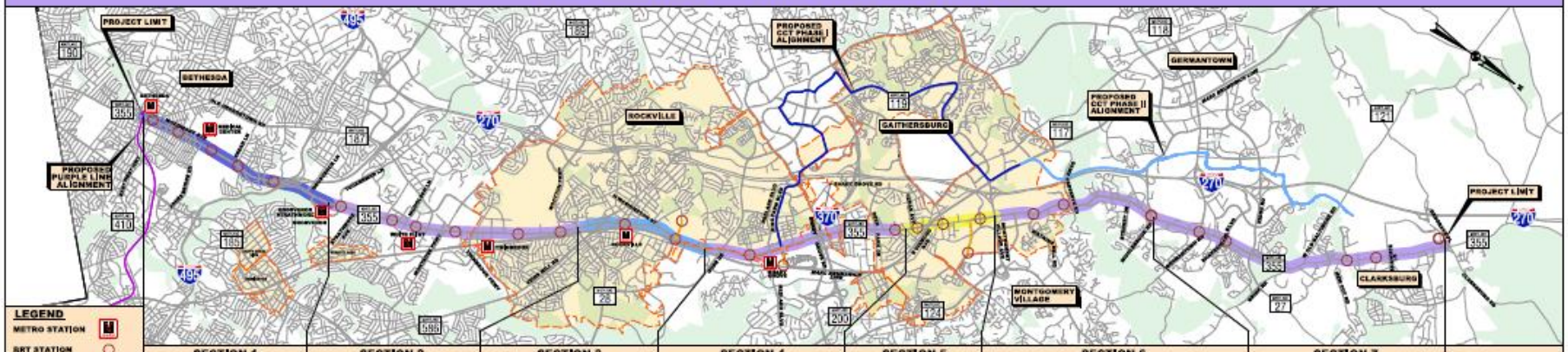
Montgomery County RAPID TRANSIT MD 355

Maryland Department of Transportation MCDOT

SECTIONS 2, 4, 6 & 7



TWO DEDICATED CURB BRT LANES WHERE FEASIBLE



SECTION 1 BETHESDA	SECTION 2 WHITE FLINT / ROCKVILLE	SECTION 3 ROCKVILLE TOWN CENTER	SECTION 4 ROCKVILLE / SHADY GROVE	SECTION 5 GAITHERSBURG	SECTION 6 MONTGOMERY VILLAGE / GERMANTOWN	SECTION 7 GERMANTOWN / CLARKSBURG	SCALE
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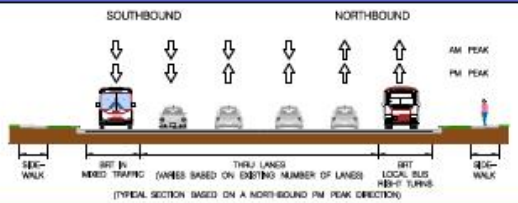
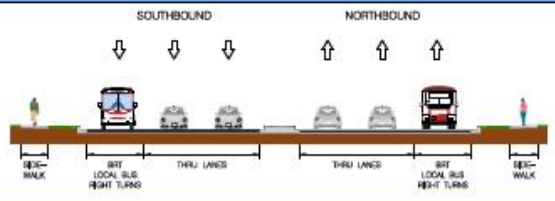
SECTION 1



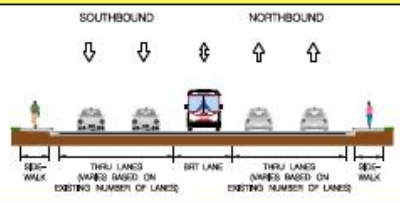
LANE REPURPOSING - CURB BRT LANE

SECTION 3



LANE REPURPOSING - TWO DEDICATED CURB BRT LANES

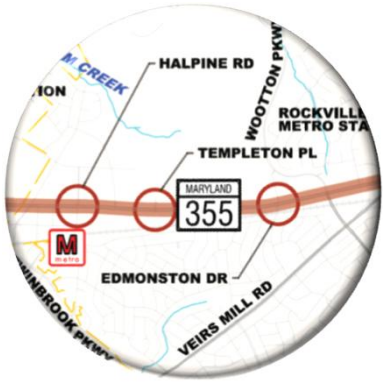
SECTION 5



LANE REPURPOSING - ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE

APPENDIX B - FIGURE 4

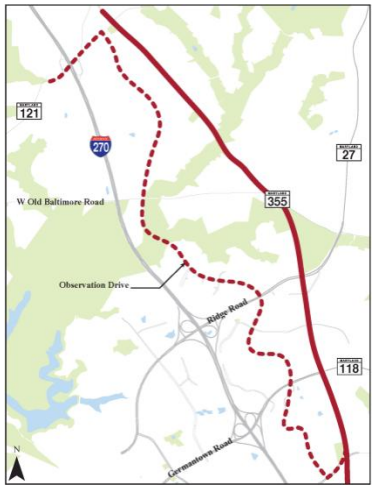
Preliminary Analysis of Conceptual Alternatives



- Differences in ridership for new BRT service between the Alternatives
- Comparison of the two northern alignments alternatives in Section 7 - MD 355 and Observation Drive
- Comparison of the two southern limits in Section 1 Grosvenor Metrorail Station and Bethesda Metrorail Station
- Effects of lane repurposing in Sections 1 and 3 (Alt 3B and 4B)
- Operational characteristics for the bi-directional running way in Section 3
- Median vs Curb Running Way Comparison
- BRT service features affecting property impacts and construction costs
- BRT service features that are affecting operational costs

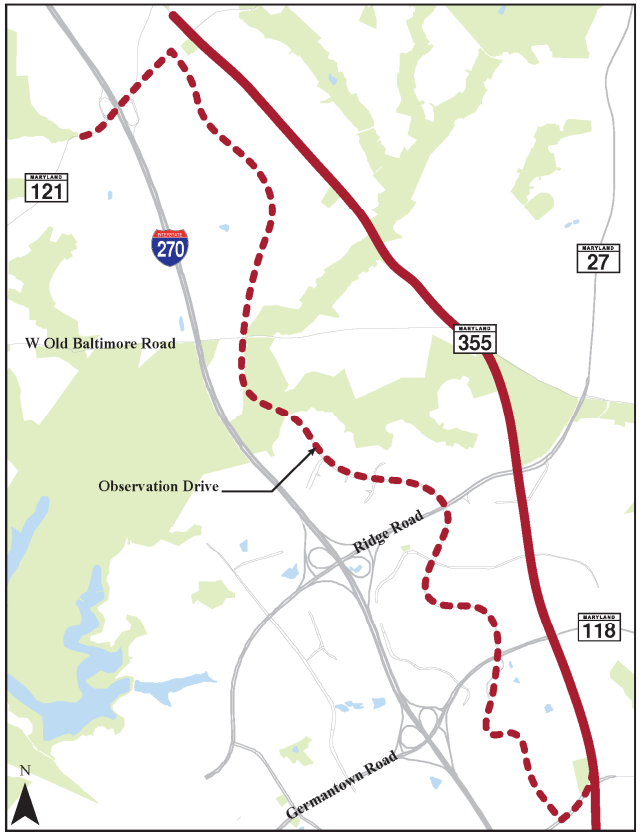
Differences in ridership for new BRT service between the Alternatives

- Providing service along Observation Drive increases ridership due to higher number of large trip generators
- Extending service to Bethesda increases ridership by expanding BRT market and providing improved transit access to additional activity centers without having to transfer to Metrorail
- In general the median running way sections have up to 20% shorter BRT travel times generating higher ridership within those sections



Comparison of the two northern alignments alternatives in Section 7 - MD 355 (Alt 3B, 4A, 4B) and Observation Drive (Alt 3A)

- Over 50% higher ridership identified along Observation Drive compared to MD 355
- It takes twice as long (or more) for the BRT to travel along Observation Drive compared to MD 355 due to longer distance and mixed traffic operations
- Observation Drive has higher ridership despite longer BRT travel times due to higher number of large trip generators
- The mixed traffic running way along Observation Drive results in lower property impacts and lower construction costs than alternatives along MD 355
- Observation Drive has operational costs that are over 40% higher than the other alternatives due to higher ridership and longer travel times



Comparison of the two southern limits in Section 1 Grosvenor Metrorail Station (Alt 3A and 4A) and Bethesda Metrorail Station (Alt 3B and 4B)

- Grosvenor
  - Terminating service at Grosvenor would result in lower property impacts, operational and construction costs
- Bethesda
  - Approximately 15% of ridership is generated at stations south of Grosvenor Metrorail Station
  - Extending service to the Bethesda Metrorail:
    - Increases the ridership along MD 355 between Middlebrook Road and Grosvenor Metrorail Station by more than 10%
    - Increases accessibility to households from activity centers by approximately 40 to 75%
    - Provides access to key activity centers including Medical Center and downtown Bethesda without having to transfer to Metrorail

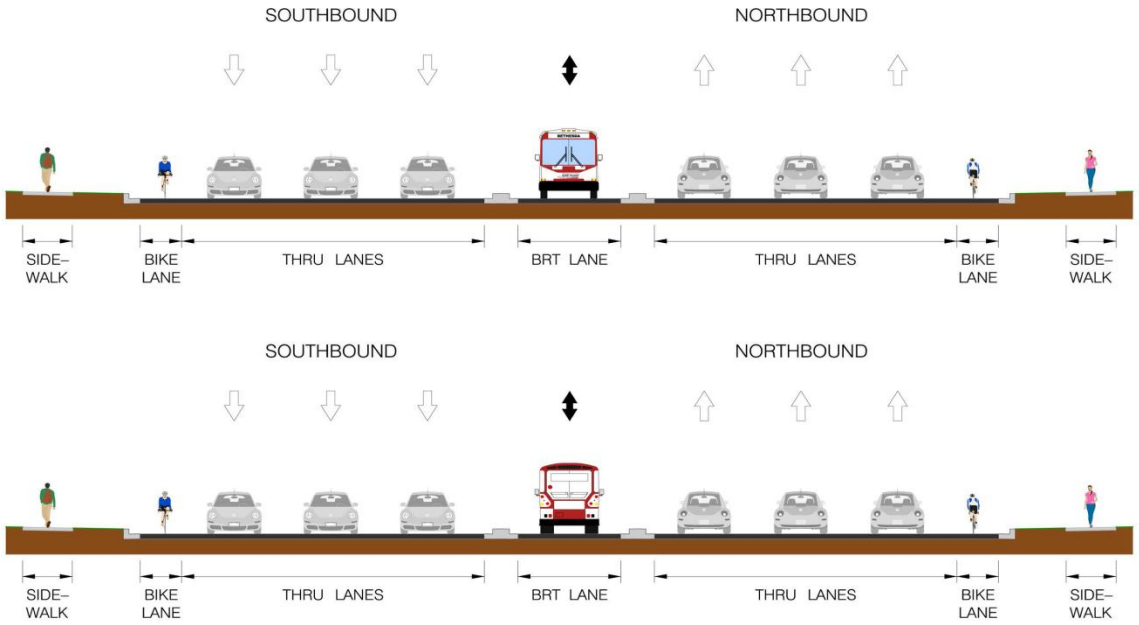
Effects of lane repurposing in Sections 1 and 3 (Alt 3B and 4B)

- The running ways where lane repurposing is being proposed result in lower impacts and lower costs
- Transit person throughput increases between 80% and 130% within the different sections with repurposed lanes compared to the No-Build Alternative
- Total person throughput decreases by up to 15% in sections where lane repurposing is being proposed due to a decrease in auto throughput outweighing increase in transit throughput

How much space does it take?

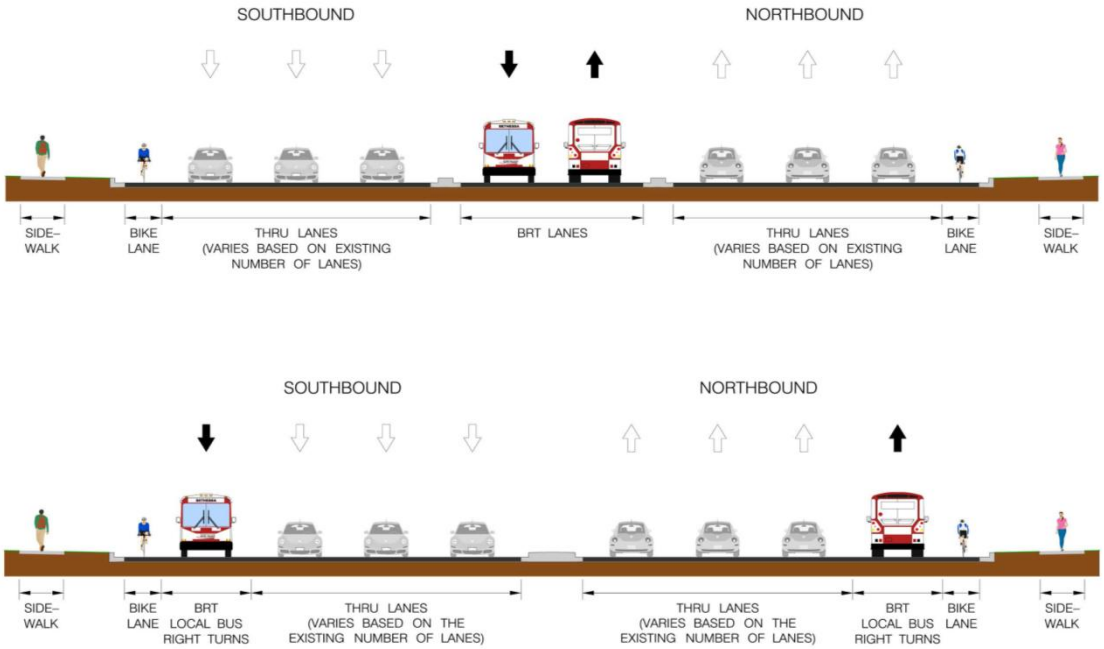
Operational Characteristics for the bi-directional running way in Section 3 (Alts. 3A and 4A)

- BRT travel times are up to 25% longer
- BRT ridership is up to 25% lower
- Average delay per BRT trip ranges from a low of 1 minute 30 seconds to more than 3 minutes
- Wider footprint results in construction costs more than 13% higher compared to lane repurposing option



Median vs Curb Running Way Comparison

- In general, the median running way sections have up to 20% shorter travel times generating higher ridership within those sections
- Median running way has a wider footprint and results in more than 25% higher property impacts and 60% higher construction costs compared to the curb running way

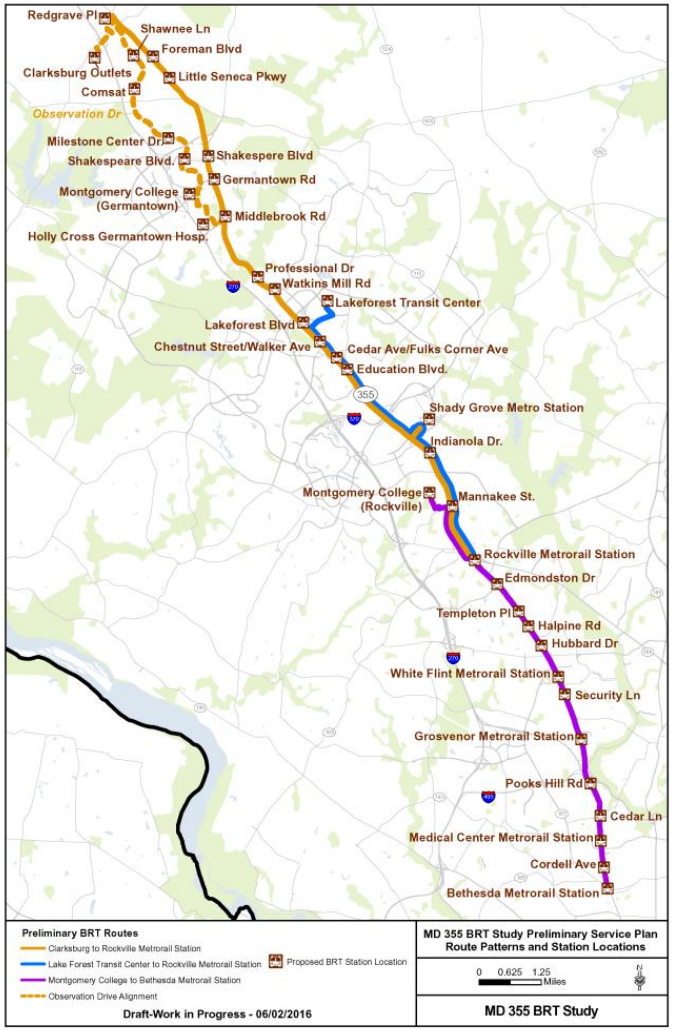


BRT Service features affecting property impacts and construction costs

- Median running way has a wider footprint and results in over 25% higher property impacts and 60% higher construction costs compared to the curb running way
- Mixed traffic running way along Observation Drive is reducing the overall property impacts on Alternative 3A
- Extending service to Bethesda results in additional property impacts for stations

BRT service features affecting operational costs

- Orange BRT Route (Clarksburg to Rockville) is more than double the cost to operate than the other BRT Routes in the service plan
- Higher ridership would require more frequent service and result in slower travel times and more buses in service, resulting in higher operational costs



Next Steps

- Collect Comments from Public Open House
- Refinement of Alternatives
- Conceptual Alternatives Report – May 2017
- Transfer of project to MCDOT

Questions?